

NEW HAMPSHIRE
DEPARTMENT OF PUBLIC INSTRUCTION
IN COOPERATION WITH
THE GENERAL EDUCATION BOARD

BUREAU OF RESEARCH
25 CAPITOL STREET
CONCORD

THE MEASUREMENT OF ABILITY TO READ

A MANUAL OF DIRECTIONS CONCERNING GIVING AND
SCORING OF READING TESTS, STATISTICAL TREAT-
MENT OF THE DATA AND DIAGNOSIS OF SCHOOL,
CLASS, AND INDIVIDUAL NEEDS

BY

H. A. BROWN,
Director of Bureau of Research

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SECOND EDITION
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THE MEASUREMENT OF ABILITY TO READ.

INTRODUCTION.

One of the leading educational problems of the present day is that of measuring in a competent manner the efficiency of the work of the public school. In the past it has been necessary to rely upon opinion in many matters relating to the progress of children in school. This has been so, unavoidably, for the reason that there have been no adequate units, scales and tests with which to measure and express educational products. It has been necessary, therefore, to state the results of educational processes thus in terms of mere conjecture, which has had small scientific value. It is true, also, that a large part of the educational practice of the past has had no scientific foundation and that the results of much of the teaching have been meagre. This, too, may be accounted for in part by the lack of adequate means of measuring the efficiency of instruction and the absence of satisfactory methods of determining in any precise manner what real results were being secured in school.

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To a certain extent this condition still prevails, and on that account it may be said that, although considerable progress has made in this direction, one of the great needs in education at the present time is the establishment of units of measurement, reliable tests and standards of attainment in each subject by which the child's progress in school may be scientifically and competently measured and the different types of instruction evaluated.

This monograph is intended to give brief, simple, untechnical directions for measuring the ability of children in silent reading, together with instructions concerning the statistical treatment of the data secured from such tests in order that a true picture of the actual condition of the

pupils who are tested in relation to ability to read may be secured.

NEED OF READING TESTS.

There is probably no subject in the school curriculum in which there is a greater need for adequate tests with which to measure the accomplishment of children than in reading. A child's progress through school depends to a very large extent upon his ability to get a maximum of the thought out of the printed page in the smallest amount of time possible. His advancement in school is likely to be seriously hindered if he does not promptly acquire the ability to read with understanding and with reasonable rapidity. To discover early in the school course the pupils who are not succeeding in mastering the art of reading and apply remedial measures is of the utmost importance, both on account of the advantage to the child himself and also from the point of view of financial economy.

It is desirable to measure reading ability in a scientific and objective manner in every school (1) for the purpose of determining the efficiency and progress of the pupils by comparison with proper standards for each grade, (2) to diagnose the needs of the class as a whole, and especially the individual needs of particular pupils, in order that future instruction may have a definite aim,—that of remedying actual defects which are known to exist and not some fancied deficiencies which are thought to prevail,—and (3) to evaluate different methods of instruction.

METHOD OF APPROACH TO THE PROBLEM.

In order to attack this problem of the pedagogy of reading in a manner most favorable to progress, the method of approach must involve three distinct lines of investigation.

(1) Studies in educational psychology have been made in large numbers and the results of these studies throw great light on many problems of teaching, especially in indicating the lines along which the most efficient and economical learning is likely to take place. The psychology of reading already has been a subject of study by a considerable group

of investigators and there is at hand a respectable body of facts in this field which are of great value to the student of experimental pedagogy. The first important step is a study of those fundamental and significant facts of the physiology and psychology of reading which throw light upon the processes involved in the act of reading.

(2) From a study of all the known facts at hand in this field, certain hypotheses in regard to the method of procedure in instruction may be established. These hypotheses will be in the form of tentative principles of teaching. When they have been formulated we may proceed to teach reading in accordance with the body of principles thus established. These working hypotheses, based upon the known laws of learning and on the nature of the mental processes in children, come from the most fruitful source,—and about the only one of great scientific value,—for it is universally recognized that knowledge regarding the laws regnant in the physical organism and predominant in the mental life of the child can furnish the only valid foundation for methods of teaching. In a word, on the basis of the data from the physiology and psychology of reading it is possible to develop an experimental technique of instruction for practical use.

(3) But even when a survey has been made of every known fact there is no positive assurance that the methods derived and the resulting educational practice are valid. A third step is necessary in establishing a valid scientific pedagogy of reading. Before we can be assured that our method is in accordance with correct principles it must be evaluated in terms of the ability of the children to read. As the process of evaluation proceeds, elements of efficiency will be found and elements of weakness will be discovered. A process of selection by which the former are selected and retained and the latter eliminated will now ensue, until in due time a new pedagogy of reading will be evolved which will be in harmony with the laws of the most economical learning.

This, in brief, is the method which must be pursued in all school subjects to secure satisfactory advancement in the

direction of the evolution of better methods of instruction, which are so imperatively needed at the present time. It is highly desirable that variations in the method of the instruction in primary reading be adopted and that systematic measurement of the results for a period of years be made for the purpose of determining definitely the elements which are most effective in producing efficiency. This gradual rebuilding of educational practice is one of the important problems of the day as the body of significant facts concerning the mental processes of children and the nature of the learning process accumulates. The existence of this problem in connection with reading makes it imperative that a means of measurement of the products and of evaluation of types of instruction be devised.

FACTORS IN READING EFFICIENCY.

In determining reading efficiency two factors must be taken into consideration. In the first place, of two readers whose grasp of content is equally great, that one who can read the larger amount in a given time has greater reading ability. Rate of reading, then, appears to be a very important factor. Again, of two people who can read the same amount in a given unit of time, that one whose grasp of content is greater is the better reader. In this case the individual who can reproduce the larger amount of what he has read and who can do so more correctly is the more efficient. The whole question of reading efficiency reduces to this: the reader who can read the largest amount in a given unit of time and whose comprehension of what he has read is best has the greatest reading ability. The two things, then, which must be accurately weighed in order to have a complete measure of reading ability are: (1) rate of reading, and (2) comprehension.

Now, the main purpose in teaching children to read is the development in them of the power to get thought from the printed or written page. The fact that a child or a class has the ability to pronounce words fluently cannot always be taken as an indication of good reading, for it may not be accompanied by adequate comprehension of the

thought. For example, a child may be obliged to spend an half hour to read a page in such a manner that he comprehends the thought to the degree that he can reproduce eighty per cent of the content. Another child may be able to read the same page with an equally efficient understanding in a few minutes. The second pupil is, of course, a much more efficient reader. Among school children all degrees of comprehension are found combined with a wide range of reading rates. Real efficiency demands a satisfactorily rapid rate of reading *combined with* an adequate power of comprehension. In the measurement of reading ability it is necessary to combine these two factors into a final measure which shall represent the total reading ability of a child or a class.

A CONNECTED PASSAGE THE BEST TEST.

It is believed that the best kind of material for a reading test is a connected passage of English in the form of a short story, a description, a piece of exposition or some similar kind of writing, in which the child's ability to react to the whole selection, or so much of it as he can read in the time given, is tested. To read, as the term is used in this bulletin, is held to mean the ability to interpret and remember the thought conveyed by the symbols of the printed page. It involves carrying the thread of the story or argument or description, grasping the essentials or gist of it, sensing the significance of the whole, retaining it in mind in a well organized form, with the ideas in rational sequence, after reading. According to our conception only this is real reading. Ability to read and ability to study are, then, synonymous terms and effective reading implies the ability to reproduce what has been read. It is for this reason that only a connected passage seems to be a satisfactory reading test. The measure of the child's ability to read used in this bulletin is his power to apprehend and reproduce in writing the thought of a simple story.

It is planned to give other tests in which the test material shall consist of subject matter from geography, history, science and other similar material.

PRELIMINARY NATURE OF THIS PLAN.

The method of measuring reading ability described in this bulletin is not intended to be a final and best method. It is tentative, provisional and suggestive. About 12,000 children in all grades from the third to the end of the high school have been tested by this method and the Bureau is now at work on the reduction of the results which are soon to be published in the form of an extended study of reading abilities, involving consideration of time allotments in relation to efficiency, a comparison of different methods, correlations between speed and comprehension and similar problems. Doubtless this study will reveal defects and indicate necessary changes in the method. The reason for issuing this bulletin describing this preliminary form of the method of measurement of reading ability is an insistent demand on the part of superintendents and teachers for it even in this imperfect state. It is believed that it is best to proceed at once with the measurement of school results with such crude methods as can be devised at the present time instead of delaying until a final and entirely satisfactory technique of measurement can be developed. Without doubt we shall in this way sooner secure satisfactory plans of testing the work of the school.

This bulletin is merely a description of the method of testing and not a survey of results. Typical cases are described only for purposes of illustration.

DESCRIPTION OF TEST.

The reading test described in this bulletin has been constructed for use in all grades above the second for the purpose of measuring ability in silent reading and it has also been given to high school pupils in each of the four years.

The plan of the test is that the children shall be given a certain specified time in which to read silently, after which they shall be required to reproduce in writing as much as they can remember of what they have read. With the data thus gained it is possible to score the different elements of their reading ability.

The thought of the selection used for the test has been

condensed into a series of short statements called the key. Each point in the key is intended to express the essential idea contained in a certain section of the test. The key as a whole is intended to express the main thought, the gist, the thread of the story of the original. It is intended to be such a reproduction of the content of the test as would represent a degree of comprehension worthy of being scored as perfect, as far as the correctness of the thought is concerned, although no child would reproduce it in just this form. This key is used as a means by which to score the child's written reproduction with the object of finding out how well he has grasped the essential ideas of the story, or in other words, carried the thread of the story. After the test has been given, it is possible to determine the amount which the child has read by counting the number of words, and how well he has reproduced the thought by comparing his reproduction with the key.

On the back of each test paper is printed the following form for each child to fill out.

Date.....Name.....
Town or city.....State.....School....Grade....
Age: years.....months.....
Name of teacher.....
This is my.....year in school

Certain assumptions have been made in connection with this test which are not true in an exact sense but which are sufficiently close approximations to give results which are accurate enough to be of great value. It has been assumed that the test used is of uniform difficulty throughout and that to reproduce the thought represented by any point of the key is the same as to reproduce that of any other. When the different sections of the selection corresponding to the various points of the key have been evaluated by approved statistical methods, results which are slightly more accurate can be secured.

THE TEST.

READING TEST NO. 1.

THE LONG SLIDE.

The boys and girls who live in a certain part of a small town in the country several miles from any village attend school in a little red schoolhouse known as the Long Hill school.

It has this name because it is situated on the top of a very long, steep hill. Ever since anyone can remember, the scholars of the Long Hill school have always had time to slide down the hill just once at recess in winter and get back to the schoolhouse before the bell rings to call them back again into school. They can go down very rapidly, but it takes a long time to walk back.

Last Monday morning Frank Lane appeared at school with a fine, new sled. It was a double-runner which his uncle, who owns a carriage factory in the city, had given him. He named his new sled the Simoon and almost had a fight with Tom Smith, who said it was foolish to put such a name on a sled, but he kept on calling it the Simoon.

At recess that day Frank invited the whole school to go for a coast and the twelve boys and girls got onto the sled and away they went down the steep hill. When recess was over, Miss Black, the teacher, rang the bell but not a scholar appeared. Thinking that the children had stopped to play on the way back from their slide, Miss Black went to the door and looked down the hill and rang the bell again. But not a scholar was in sight. Then she was greatly astonished and began to be very angry, for nothing like this had ever happened in all of her twenty-eight years as a teacher. She waited and waited, but still no scholars appeared. She stopped every team that came up the hill, but no one had seen anything of them.

She stayed at the schoolhouse and wondered what had become of her children until it was time to let

out school and then she went over to John Reed's, who lives nearest to the schoolhouse and whose son and daughter were among the missing scholars. Mr. Reed was greatly frightened at what Miss Black told him about the disappearance of her school and immediately hitched up his horse to go in search of the lost children. Just as he was driving out of the doorway, the scholars appeared far down the hill. It was almost dark before they got back to the schoolhouse.

Frank Lane, who was the largest boy in the school and the owner of the Simoon, had to explain to Miss Black the cause of their absence. At the foot of the hill there was a road broken through the field to a logging road which ran down through a swamp to a stream. When they reached the foot of the hill, Frank steered the Simoon into the road which led through the field. The Simoon ran so easily over the frozen snow that it took the children clear through to the logging road. This had been sprinkled with water and had frozen hard the night before and ran down hill. When the Simoon struck this road it kept on going faster and faster and Frank was unable to stop it. When it reached the stream, which was covered with smooth ice, it went even faster and kept on going until it had gone clear down to Rand's mill, which was three miles from the schoolhouse. Frank told Miss Black about their long slide and said that he did not intend to run away with the whole school, but he could not stop the sled. He explained that they came back as quickly as they could, but the road was so slippery that they had to haul the girls and some of the small boys and that for this reason it took a long time to get back. He said that he hoped the teacher would consider it an accident.

Frank does not know yet what is going to happen to him, but he can bear up under quite a severe punishment, for Edward Post has been telling for the last ten years about the long slide he made once on Long Hill. But Frank's slide was a mile and a half longer than Edward's. Ever since that day no one has dared to take even a short coast at recess.

THE KEY.

1. *Some children in the country attend school.*
2. *The schoolhouse is known as the Long Hill School.*
3. *It is situated on top of a long hill.*
4. *The pupils slide down hill once at recess in winter.*
5. *One day a boy brought to school a new sled.*
6. *His uncle had given it to him.*
7. *He named it the Simoon.*
8. *He almost had a fight with another boy.*
9. *This boy said the name was foolish.*
10. *At recess the pupils went for a slide.*
11. *At the end of recess no pupils appeared.*
12. *The teacher was astonished and angry.*
13. *Nothing like this had ever happened before.*
14. *After a long wait no scholars appeared.*
15. *No one in passing teams had seen her school.*
16. *She stayed at school until closing time.*
17. *Then she went to the nearest neighbor.*
18. *His children were among the scholars.*
19. *He was greatly frightened.*
20. *He started to search for the children.*
21. *Just then they appeared down the hill.*
22. *They reached the schoolhouse just before dark.*
23. *The owner of the sled explained their absence.*
24. *At the foot of the hill was a road through a field.*
25. *It led to a logging road.*
26. *This ran down to a stream.*
27. *He turned into the road through the field.*
28. *The frozen snow made it impossible to stop.*
29. *On the stream the sled went faster.*
30. *It went three miles from the schoolhouse.*
31. *He did not intend to run away.*
32. *They came back as quickly as possible.*
33. *They had to haul some of the children.*
34. *Therefore it took a long time.*
35. *He hoped the teacher would consider it an accident.*
36. *He does not know what will happen to him.*
37. *He can bear a severe punishment.*
38. *Another long slide has been talked about for years.*
39. *His was a mile and a half longer.*
40. *No one has coasted at recess since that day.*

DIRECTIONS FOR GIVING THE TEST.

The most convenient form for arranging the selection, when it is printed for a test, is to have it arranged as a folder in the form of the two pages of an open book as it appears when it lies before the child on the top of his desk. The test will make just about two pages if the length of the lines and the size of type conform to the requirements of a correctly printed reading book for third or fourth grade.

The test papers should be given out to the children on the tops of their desks, with the printed side down. Each child should then fill out the blank on the back of his folder. It should be in such a position on the desk that the end which has the blanks is at the child's left hand. They should take hold of the folders with the thumb and finger of the right hand, and when the time comes to turn the papers over to read, they should do so by a quick movement of the hand to the left. The object is to get the paper turned over quickly at the signal and have it in the right position to begin reading.

The directions to the children before turning their papers should be given and talked over until it is certain that every child understands them. The examiner should explain to the children that they are not to take an examination and that nothing in the way of rank depends upon this test, in order that they may recover from any nervousness due to having a stranger come into the room. They should be told, however, that it is desired that they do their best with the test but it is best not to use the word *test*, especially with the younger children. The examiner should talk with the children for a few minutes until they are at ease and have recovered from their embarrassment.

He should explain to them that the papers which they have on their desks have an interesting story on the other side and that he is to give a signal soon at which they are to turn the papers over and read as much of the story as they can in the time given. It is well to tell them that the time for reading will be rather short and that they are to read as much as they can in the time allowed, but that they are to strive to understand and remember what is read as

well as possible. In other words, they are not to read so rapidly as not to remember what they read, nor are they to read too slowly. The idea is, in a word, that they shall read as much as possible in the time given and at the same time read carefully enough to be able to reproduce the essentials of the story after it is read. The examiner will need to take plenty of time to make it clear to the children what is desired of them. Experience with about twelve thousand children indicates that it is not difficult to make them understand and follow these directions.

The proper procedure in giving the test is to give a signal by saying "Start," at which the children turn their papers over and begin to read silently. At a second signal, which is given by saying "Stop," each child promptly stops reading, draws a circle around the word at which he left off and immediately turns his paper over.

When the proper explanations have been made the signal should be given to start. At the end of *exactly one minute* the signal to cease reading should be given. The papers ought to be collected immediately. The children will then be asked to write all they can remember of the story. For this they may be allowed all the time they need.

THE SCORING OF THE PAPERS.

Data are now at hand for the determination of each child's score in the two factors in reading ability.

(1) The rate of reading should be first found by counting the number of words read by each child. This should be expressed in words per second.

(2) In the determination of comprehension two elements should be taken into consideration, which have been called (a) the quantity of reproduction and (b) the quality of reproduction. (a) Each child's written paper should be carefully examined and the number of the points in the key which are reproduced by him should be determined and expressed as a percentage of the total number in the portion of the selection which he read. For example, in the part read by a certain child there may have been twenty points and he may have reproduced five of these. The amount reproduced was, therefore, twenty-five per cent of

what he read. This is called quantity of reproduction. In ascertaining the number of ideas reproduced by each child to get the measure of quantity, every idea should be counted which in most respects is complete and in general correctly stated, even though some of the less important details are lacking. (b) The reproductions should be examined a second time and only those ideas counted which are entirely correct in every respect and of which every detail is reproduced. This is called quality of reproduction.

To give credit for quantity in the case of any point all elements of the idea expressed by the words in italics in the key must be in the child's reproduction, either expressed or plainly implied.

The chief advantage of scoring the child's reading ability for both quantity and quality lies in the possibilities of diagnosing individual deficiencies which are thus afforded. This will be pointed out later.

But a measure of rate of reading and comprehension taken separately will not prove satisfactory. One child may have a high reading rate, and a low comprehension. A second child may have a low reading rate, and a high comprehension. It may be difficult to determine the exact difference in ability in such a case. For example, suppose the averages of one grade are:

Rate of reading, 2.16 words per second.

Comprehension, 47.62.

Let the averages for another grade be:

Rate of reading, 3.19 words per second.

Comprehension, 31.11.

It is difficult to say at a glance just how much more reading ability one has than the other. It is necessary that some unit of measurement be established by which the total reading efficiency of an individual or a class may be expressed in a single figure.

Such a unit was arbitrarily established and was defined as follows. One unit of reading efficiency is a reading ability in which such a rate of reading in words per second is combined with such a power of reproduction that the product of the number representing the rate and that representing the comprehension is unity. A person who can read at

the rate of 0.5 words per second and whose comprehension is 2 has 1 unit of reading efficiency. A reading rate of 0.25 words per second combined with a comprehension of 4 would also represent the same unit, as would many other variations of the two factors. In this computation the percentage of comprehension, as, for example, 41.15 per cent, is regarded as the number 41.15 and is multiplied by the rate. If the rate in this case was 2.15 words per second, the number of reading units would be the product of these two, or 88.47. This gives us a crude unit by which reading efficiency may be expressed in a comprehensible form. There is, of course, no mathematical relation between these figures. This unit is adopted purely arbitrarily as a rough but convenient means of expressing reading power in definite comparable units. Any child's reading efficiency may be found by taking the product of the number representing reading rate and that representing comprehension.

Reading material of different degrees of difficulty will be found, however, and an individual who has the ability to read at a certain rate and reproduce a certain percentage of what he has read in one selection may not have the same reading rate and power of reproduction in connection with matter twice as hard. The unit of reading efficiency must always be spoken of in connection with material of a certain degree of difficulty. The use of this unit is wholly for purposes of comparing child with child, grade with grade or school with school when the same test material has been used.

A good method of procedure in scoring the papers is to place the key and the child's reproduction side by side on a table. The first point in the key should be examined and then the child's reproduction should be carefully scrutinized to see if it contains a correct statement of the thought of the point. It should be borne in mind that the child's language may be entirely different from the wording of the idea in the key. The purpose of the one scoring the paper should be to see if that idea is expressed in the child's own language or sufficiently plainly implied by what he has written, with sufficient completeness and accuracy to be credited for

quantity. If so, it should be scored. All of the points should be considered in the same manner. Each point should next be examined with reference to quality and scored if it meets the requirements. When the entire paper has been scored, the number of points scored for quantity and the number for quality should be counted and each expressed as a percentage of the total number in the portion of the selection read by the particular child in question. The average of quantity and quality should be taken as the measure of the child's comprehension.

The scorer must use the best of judgment in determining whether to give credit for any point. Everything which the child says in any way related to the idea in question should be considered, and if it seems from his language that he has the idea with the required degree of completeness and correctness in the case of either quantity or quality it should be credited.

The reason for getting comprehension by the method used is as follows. Many children will reproduce a good many ideas with some inaccuracy and some omissions. They should have some credit for this but less than full credit to the extent that their reproduction is incorrect and inaccurate. It is believed, after scoring about twelve thousand papers in this manner, that, by getting quantity and quality of reproduction by this method and averaging them, a very fair estimate of the child's comprehension is secured. Quality serves as a check on quantity and reduces the child's mark for comprehension in proportion as his work is inaccurate and incomplete.

RECORDS AND TABULATION OF DATA.

It is very important, after the tests have been given, to get from the results all the significant information which they contain. For that reason certain tabulations of the data are advised and it is also recommended that the records of each test be filed permanently for purposes of comparison with the results of future tests. Six blanks, called Forms A, B, C, D, E, and F indicate the data which should be secured at the time of each test.

On Form A the records of all the individual pupils should be entered at the time of each test, together with their names and ages. On Form B should be given a summary of the data found on Form A. Directly after the column in which the rates of reading are entered on Form A is found a column called *Deviation*, and on Form B space is given for entering average deviation and variability. These should be computed in connection with each reading test.

It has been pointed out by various writers that an average is not a truly representative measure. For example, two grades may have the same average or median rate of reading but the individuals may vary widely from this central tendency in one case and may be grouped closely around it in the other. The average deviation of the grade gives the average amount of this variability, but it is impossible to compare the variability of two grades, when the averages are different, by merely referring to the average deviation. For this reason, the variability should be given. This may be found by expressing the average deviation from the average as a percentage of the average. If the median is used, instead of the average, the process is the same. Thus one grade with a comprehension of 40 may have an average deviation of 8, and another grade with the same comprehension may have an average deviation of 17. This means that the former class is very much better graded than the latter. Again, if we have two grades with a comprehension of 50 and 80 respectively and the average deviation in both grades is 12, in the case of the first the variability is 24 per cent and in the case of the second it is 15 per cent. For these reasons, in the case of rate of reading, comprehension and reading efficiency, as called for on Form A, it will be necessary to determine the deviation of each pupil's score from the central tendency, which may be either average or median.

Nothing less than a complete table of frequencies gives a complete statement of the facts concerning any grade. For this reason Forms C, D and E should be used.

The information called for on Form F, if gathered faithfully for a number of years, in connection with the results

READING RECORD

Form B

SUMMARY OF GRADE RECORDS

Town_____

Date of Test_____

School_____

Grade	No. of Pupils	Average Age		Measure	Rate of Reading	Compre- hension	Reading Efficiency
		Yr.	Mo.				
III				Highest			
				Lowest			
				Average*			
				Average Deviation			
				Variability			
IV				Highest			
				Lowest			
				Average			
				Average Deviation			
				Variability			
V				Highest			
				Lowest			
				Average			
				Average Deviation			
				Variability			

* In place of average median may be used if it is preferred.

READING RECORD—*Concluded*

Grade	No. of Pupils	Average Age		Measure	Rate of Reading	Compre- hension	Reading Efficiency
		Yr.	Mo.				
VI				Highest			
				Lowest			
				Average			
				Average Deviation			
				Variability			
VII				Highest			
				Lowest			
				Average			
				Average Deviation			
				Variability			
VIII				Highest			
				Lowest			
				Average			
				Average Deviation			
				Variability			
Av. for entire school							

READING RECORD

Form D

TABLE OF FREQUENCIES—FOR COMPREHENSION

Town _____

Date of Test_____

School_____

Grade_____

[illegible]

READING RECORD
Form F
ANNUAL SCHOOL REPORT

Town_____

Dates of Tests, 1 _____

School_____

2 _____

3 _____

	I.	II.	III.	IV.
1. Total number of minutes per week devoted to class reading in each reading class, including word or phonetic drill.....				
2. Approximate amount of phonetic drill in minutes per week in each reading class.....				

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
3. Number of books read for class reading by each grade this year.....								
4. Average number of books read by each grade for silent reading this year..... (Include here all reading done by pupils outside of class, in school or out. If records have not been kept give an estimate.)								
5. What proportion of the class reading in each grade was at sight?.....								
6. Average age of the classes tested at time of each test.....	I							
	2							
	3							

7. What system of reading, if any, is used in primary grades? _____

8. In what respect is this system modified, i. e., in what particulars does the method differ from the directions given in the printed manual of the system? (Be specific and go into detail in your answer, using additional sheets if necessary.)

9. If no standard system of reading is used give a *detailed description* of the method used in the first four grades, using additional sheets if necessary.

READING RECORD

Form H

RECORD OF READING DONE

Town_____ School_____ Grade_____

Year_____ How many of the books read in class were read at sight?_____

No.	Children.	Number of Books Read for Class Reading.	Number of Books Read Outside of Class for Silent Reading.*
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

* Include here all books read during the year for silent reading in school and out.

of the tests of reading efficiency tabulated on Forms A, B, C, D and E, would be of the greatest value. The results of modifications of method, such as variations in the amount of reading done in class and for silent reading, the time allotment to the subject, and the amount of phonetic drill, could easily be ascertained. Forms A, B, C, D, E and G should be filled out after each test, and Form F at the end of the year.

It will be found very desirable to keep a record of the facts called for in Form H also.

DIAGNOSIS OF CLASS AND INDIVIDUAL NEEDS

In Table 1 are given, for purposes of illustration, the data from an actual third grade. This grade stood second among thirteen third grades which were tested and represents a somewhat satisfactory efficiency. Examination of the averages shows that the rate of reading, the comprehension and the reading ability of the class as a whole are high. The rate of reading is seen to be very high.

It is possible from the data given in Tables 1, 2, 3, 4 and 5 and the graphs presented in Figs. 1, 2, 3 and 4 to get an accurate picture of the condition of the class. Fig. 1 shows the reading rate, and it appears that there is a variation from 1.28 words per second to 6.02. This is a larger variation than ought to exist in a grade but no larger than that usually found. The average comprehension of the class is 40, which is high, and the reading efficiency, which is 114.79, is high. We find individual variations in comprehension and reading efficiency, but these are not nearly so great as in most of the classes thus far tested. In fact, it can be said that the class is in a rather satisfactory condition in this respect. While the rate of reading is high, there are, however, ten pupils whose rate is considerably below the average of the class. They should be given special quick perception practice daily to bring their rate of reading up to a higher standard. There are ten pupils whose comprehension falls considerably below the average of the class, four of whom fall conspicuously low and can easily be identified in Fig. 2. They need special practice in

TABLE I
Form A

GRADE RECORD

Town X
School ADate of Test, June 4, 1915
Grade III

No.	Name	Age Yr. Mo.	Rate of Reading	Devia- tion	Quantity of Repro- duction	Quality of Repro- duction	Compre- hension	Devia- tion	Reading Efficiency	Devia- tion
1			1.28	-1.79	75	75	75	+35	96.00	-18.79
2			1.60	-1.47	75	..	38	-2	60.80	-53.99
3			1.85	-1.22	75	50	63	+23	116.55	+1.76
4			2.07	-1.00	80	20	50	+10	103.50	-11.29
5			2.15	-.92	60	20	40	...	86.00	-28.79
6			2.33	-.74	80	60	70	+30	103.10	+48.31
7			2.36	-.71	33	33	33	-7	77.88	-36.91
8			2.38	-.69	83	33	58	+18	138.04	+23.25
9			2.38	-.69	67	33	50	+10	119.00	+4.21
10			2.63	-.44	43	29	36	-4	94.68	-20.11
11			2.98	-.09	44	44	44	+4	131.12	+16.33
12			2.98	-.09	33	11	22	-18	65.56	-49.23
13			3.00	-.07	33	00	17	-23	51.00	-63.79
14			3.15	+.08	33	11	22	-18	69.30	-45.49
15			3.26	+.19	22	..	22	-29	35.86	-78.93
16			3.28	+.21	44	22	33	-7	108.24	-6.55
17			3.32	+.25	70	40	55	+15	182.60	+67.81
18			3.78	+.71	36	27	32	-8	120.96	+6.17
19			4.30	+1.23	45	18	32	-8	137.60	+22.81
20			4.60	+1.53	50	8	29	-11	133.40	+18.61
21			5.83	+2.76	69	50	60	+20	349.80	+35.01
22			6.02	+2.95	17	11	14	-26	84.28	-30.51
	Average		3.07	0.90			40	15	114.79	+0.39

TABLE 2

Form B

SUMMARY OF GRADE RECORD

Town X
School A

Date of Test, June 4, 1915

Grade	No. of Pupils	Average Age		Measure	Rate of Reading	Compre- hension	Reading Efficiency
		Yr.	Mo.				
III	22	9	6	Highest	6.02	75	349.80
				Lowest	1.28	11	35.86
				Average	3.07	40	114.79
				Average Deviation	0.90	15	40.39
				Variability	29.3%	37.5%	35.18%

TABLE 3

Form C

TABLE OF FREQUENCIES—FOR RATE OF READING

Town X
School ADate of Test, June 4, 1915
Grade III

Frequency (Number of Cases)	Quantity (Rate of Reading)
0	0 - .49
0	.5 - .99
1	1 - 1.49
2	1.5 - 1.99
6	2 - 2.49
3	2.5 - 2.99
5	3 - 3.49
1	3.5 - 3.99
1	4 - 4.49
1	4.5 - 4.99
0	5 - 5.49
1	5.5 - 5.99
1	6 - 6.49

TABLE 4
TABLE OF FREQUENCIES—FOR COMPREHENSION

Town X
School A

Date of Test, June 4, 1915
Grade III

Frequency (Number of Cases)	Quantity (Comprehension)
0	0 - 4.99
2	10 - 14.9
1	15 - 19.9
2	20 - 24.9
1	25 - 29.9
4	30 - 34.9
2	35 - 39.9
2	40 - 44.9
0	45 - 49.9
2	50 - 54.9
2	55 - 59.9
2	60 - 64.9
0	65 - 69.9
1	70 - 74.9
1	75 - 79.9

rapid silent reading with special emphasis upon getting a maximum of content from what is read. The four who get the lowest marks in comprehension are seen on Fig. 3 to have a very low score for reading efficiency.

In Table 2 only the average scores are given. Tables 3, 4 and 5 illustrate the method of expressing the scores in terms of their frequencies and show the same facts as Figs. 1, 2 and 3. Fig. 4 expresses the facts of Table 5 in the form of a surface of frequency.

We may now examine a number of individual cases. It is easy to see that Pupil No. 1 is deficient in the rate at

TABLE 5

Form E

TABLE OF FREQUENCIES—FOR READING EFFICIENCY

Town X

Date of Test, June 4, 1915

School A

Grade III

Frequency (Number of Cases)	Quantity (Reading Efficiency)
0	0 - 19.9
1	20 - 39.9
1	40 - 59.9
4	60 - 79.9
4	80 - 99.9
4	100 - 119.9
5	120 - 139.9
0	140 - 159.9
1	160 - 179.9
1	180 - 199.9
0	200 - 219.9
0	220 - 239.9
0	240 - 259.9
0	260 - 279.9
0	280 - 299.9
0	300 - 319.9
0	320 - 339.9
1	340 - 359.9

which he can read. He gets a relatively large proportion of the content at his present rate of reading but he reads so little in a unit of time that his efficiency is low. He should have practice to increase his speed, and if it is found that at a higher rate of reading his comprehension is poor he should be given practice for the purpose of bringing about improvement along this line, also. Pupil No. 2 has a difficulty which

is easy to diagnose. In the first place his rate of reading is not sufficiently rapid, but on quantity of reproduction he stands high. His mark for quality, on the other hand, falls to zero. In other words, he gets a good many ideas in the rough but gets nothing accurately. We see in the case of



Fig. 1—Curve representing the rate of reading in a third grade of 22 pupils, School A. The scale along the base of the figure represents the numbers of the children in the grade. The scale at the left shows the rate of reading in words per second. The papers were arranged in the order of rate of reading.

this pupil one advantage of the method of scoring reading ability advocated in this bulletin. It enables us to find more correctly the exact location of defects in the reading ability of individual children. What this pupil gets is a mere smattering of the idea. His low mark for comprehension, together with his low rate of reading, gives him a

low efficiency. He needs to work both for speed and for accuracy. Pupil No. 4 reads at a rate considerably below the average. He gets in a rather rough way a very large

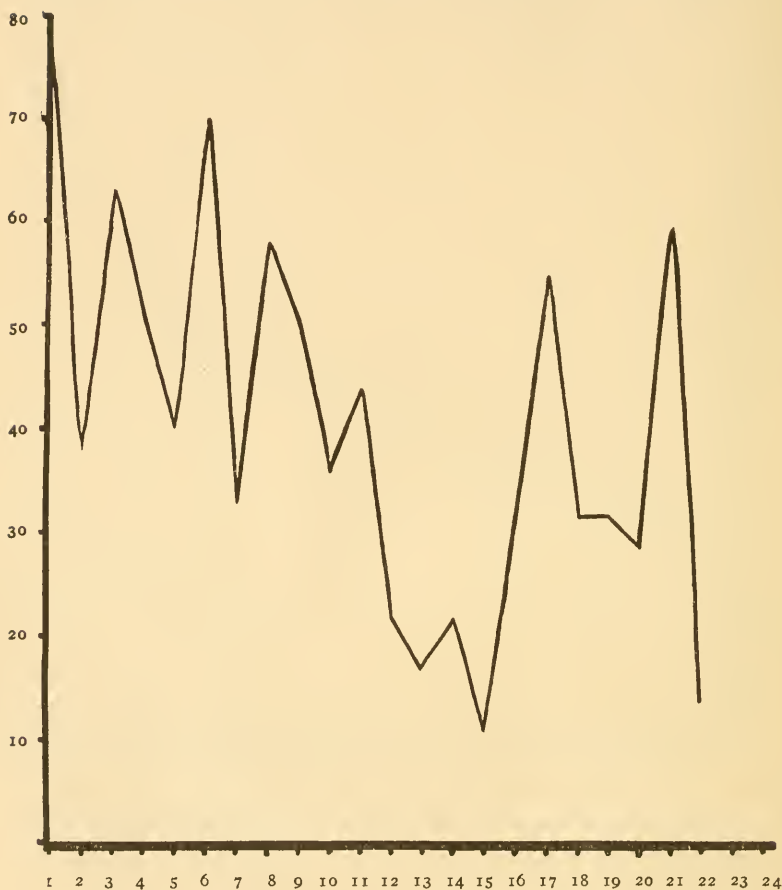


Fig. 2—Curve representing comprehension of the same children as in Fig. 1 and in the same order. The scale at the left shows the comprehension.

percentage of the ideas, but he is very inaccurate. He merely skims what he reads. He is in need of the same treatment as Pupil No. 2. The same difficulty exists in the case of Pupil No. 8. Pupil No. 13 reads reasonably

rapidly but remembers little of what he reads, and gets nothing absolutely correctly. The same is true of Pupil No.



Fig. 3—Curve representing the reading efficiency of the same children as in Figs. 1 and 2, and arranged in the same order. The scale at the left shows the reading efficiency.

15. An interesting comparison may be made in the case of Pupils No. 21 and No. 22. Both read with great rapidity. Pupil No. 21 remembers a large amount of what he reads

and remembers it accurately. On account of this and his high rate of reading he stands the highest in the class in efficiency. Just the reverse is true of Pupil No. 22. While he covers a great deal of ground, he gets almost nothing out of it.

A pupil like No. 21 is so superior to the rest of the class that probably he profits little or nothing from the daily routine reading lesson. Such children should be removed from the reading class at once, for they need no more drill in reading as such. The ordinary daily exercises in oral reading, as usually conducted, would amount for such pupils to daily practice in slowing down their rate of reading.

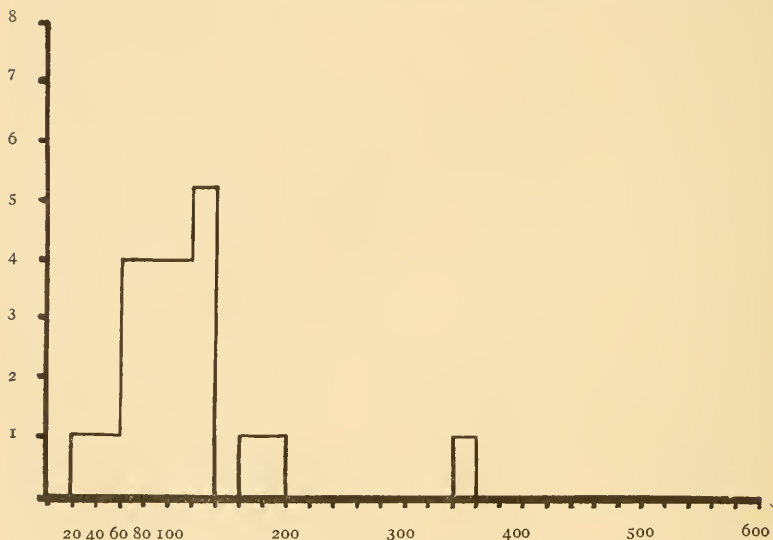


Fig. 4—Surface of frequency showing the distribution of reading efficiency in the same third grade as in Figs. 1, 2 and 3. The scale along the base of the figure represents the reading efficiency. The scale at the left shows the number of children in each group. Fig. 4 expresses the facts of Table 5.

Probably Pupils No. 6 and No. 17 cannot receive maximum profit from reading with this class. These three pupils can easily be identified in Fig. 4 on the upper part of the scale above the majority of the class and by the three conspicuously high points in the curve in Fig. 3. It is doubtful, also,

whether Pupils No. 13 and No. 15 belong in this class. Reading material and instruction adapted to the average of the class would hardly be suited to their needs. These two pupils may be easily identified in the two lowest points of the curves in Figs 2 and 3 and also on the lower end of the scale in Fig. 4.

An examination of Fig. 4 reveals, on the whole, a very satisfactory condition. With the exception of five pupils, No. 6, No. 17 and No. 21 on the upper side of the scale and No. 13 and 15 on the lower, the group is homogeneous and compact, which is a favorable condition for teaching. While four of these five pupils would undoubtedly do better in a class more nearly of their own ability, yet they do not differ so greatly from the average of the class as to fail entirely to profit from the instruction.

This is intended to illustrate the method by which individual pupils may be selected and their particular deficiencies studied. It is not intended to be an exhaustive study of the class. There is no doubt that by a study of the scores of the different individual pupils in the various elements of reading ability given in Table 1 and the application of the proper remedial measures in each case, the total efficiency of the class could be raised very much higher than it is at the present time.

COMPARISON OF ONE SCHOOL WITH ANOTHER.

For purposes of comparison the data from School B are presented. School A represented a rather satisfactory condition, but School B, on the other hand, represents conditions which in many respects are undesirable, and, had the proper measures for remedying the various defects been applied, the present deficiencies would not prevail to the extent to which they are found. Tables 6, 7, 8, 9 and 10

TABLE 6
Form A
GRADE RECORD

Date of Test, June 4, 1915
Grade III

Town Y
School B

No.	Name	Age		Rate of Reading	Devia- tion	Quantity of Repro- duction	Quality of Repro- duction	Compre- hension	Devia- tion	Reading Efficiency	Devia- tion
		Yr.	Mo.								
1				.28	-1.15	..	..	..	-33		-54.23
2				.58	-.85	..	..	..	-33		-54.23
3				.58	-.85	33	..	17	-16	9.86	-44.37
4				.58	-.85	100	..	50	+17	29.00	-25.23
5				.70	-.73	..	..	..	-33		-54.23
6				.87	-.56	33	..	17	-16	14.79	-39.44
7				.87	-.56	100	33	67	+34	59.16	+4.93
8				.90	-.53	67	33	50	+17	45.00	-9.23
9				.95	-.48	..	..	..	-33		-54.23
10				1.17	-.26	75	25	50	+17	58.50	+4.27
11				1.60	+.17	100	75	88	+55	140.80	+86.57
12				1.60	+.17	25	..	13	-20	20.80	-33.43
13				1.60	+.17	75	25	50	+17	80.00	+25.77
14				1.85	+.42	25	..	13	-20	24.05	-30.18
15				1.85	+.42	..	..	..	-33		-54.23
16				1.85	+.42	25	..	13	-20	24.05	-30.18
17				1.85	+.42	..	..	..	-33		-54.23
18				1.85	+.42	75	25	50	+17	92.50	+38.27
19				1.98	+.55	50	25	39	+6	77.22	+22.99
20				2.07	+.64	80	40	60	+27	124.20	+69.97
21				2.07	+.64	40	10	25	-8	51.75	-2.48
22				2.20	+.77	80	60	70	+37	154.00	+99.77
23				3.22	+1.79	90	60	75	+42	241.50	+187.27
Average				1.43	.60			32	25	54.23	46.94

TABLE 7

Form B

SUMMARY OF GRADE RECORD

Town Y

Date of Test, June 4, 1915

School B

Grade	No. of Pupils	Average Age		Measure	Rate of Reading	Compre- hension	Reading Efficiency
		Yr.	Mo.				
III	23	10	0	Highest	3.22	88	241.50
				Lowest	.28	00	00
				Average	1.43	32	54.23
				Average Deviation	.60	25	46.94
				Variability	42%	78.1%	88.16%

TABLE 8

Form C

TABLE OF FREQUENCIES—FOR RATE OF READING

Town Y

Date of Test, June 4, 1915

School B

Grade III

Frequency (Number of Cases)	Quantity (Rate of Reading)
1	0 - .499
8	.5 - .999
1	1 - 1.499
9	1.5 - 1.999
3	2 - 2.499
0	2.5 - 2.999
1	3 - 3.499

TABLE 9

Form D

TABLE OF FREQUENCIES—FOR COMPREHENSION

Town Y

Date of Test June 4, 1915

School B

Grade III

Frequency (Number of Cases)	Quantity (Comprehension)
6	0 - 4.99
0	5 - 9.99
3	10 - 14.99
2	15 - 19.99
0	20 - 24.99
1	25 - 29.99
0	30 - 34.99
1	35 - 39.99
0	40 - 44.99
0	45 - 49.99
5	50 - 54.99
0	55 - 59.99
1	60 - 64.99
1	65 - 69.99
1	70 - 74.99
1	75 - 79.99
0	80 - 84.99
1	85 - 89.99

TABLE 10

Form E

TABLE OF FREQUENCIES—FOR READING EFFICIENCY

Town Y

Date of Test June 4, 1915

School B

Grade III

Frequency (Number of Cases)	Quantity (Reading Efficiency)
8	0 - 19.9
4	20 - 39.9
4	40 - 59.9
1	60 - 79.9
2	80 - 99.9
0	100 - 119.9
1	120 - 139.9
2	140 - 159.9
0	160 - 179.9
0	180 - 199.9
0	200 - 219.9
0	220 - 239.9
1	240 - 259.9

and Figs. 5, 6, 7 and 8 show the essential facts for School B. If we compare Table 3 with Table 8 and Fig. 1 with Fig. 5, we shall see the differences in the rate of reading. In both cases there is a wide range, but in the case of School B the rate is very low throughout, while the rate for School A is high. With a uniform comprehension in both cases, School A would rank much higher than School B. It is entirely clear that a majority of the pupils in School B need a great deal more special drill for the purpose of raising the rate of reading. If next we turn to Tables 4 and 9 and Figs. 2 and 6, we shall see how the schools compare in comprehension. While there is a somewhat wide variation in the

case of School A, the individual differences in this respect in School B are extremely marked. This school represents a condition which should never be allowed to exist and which makes it impossible to secure the best results from



Fig. 5—Curve representing the rate of reading in a third grade of 23 pupils, School B. The papers were arranged in order of rate of reading. Compare Fig. 5 with Fig. 1.

the instruction. An examination of the reading efficiencies in the case of the two schools, as represented in Tables 5 and 10 and Figs. 3 and 7, reveals a very unsatisfactory efficiency in the case of School B. In fact, the low standing of the pupils in rate of reading and comprehension inevitably leads to a low general efficiency. It is interesting to compare the distributions of reading efficiency in the two schools, as

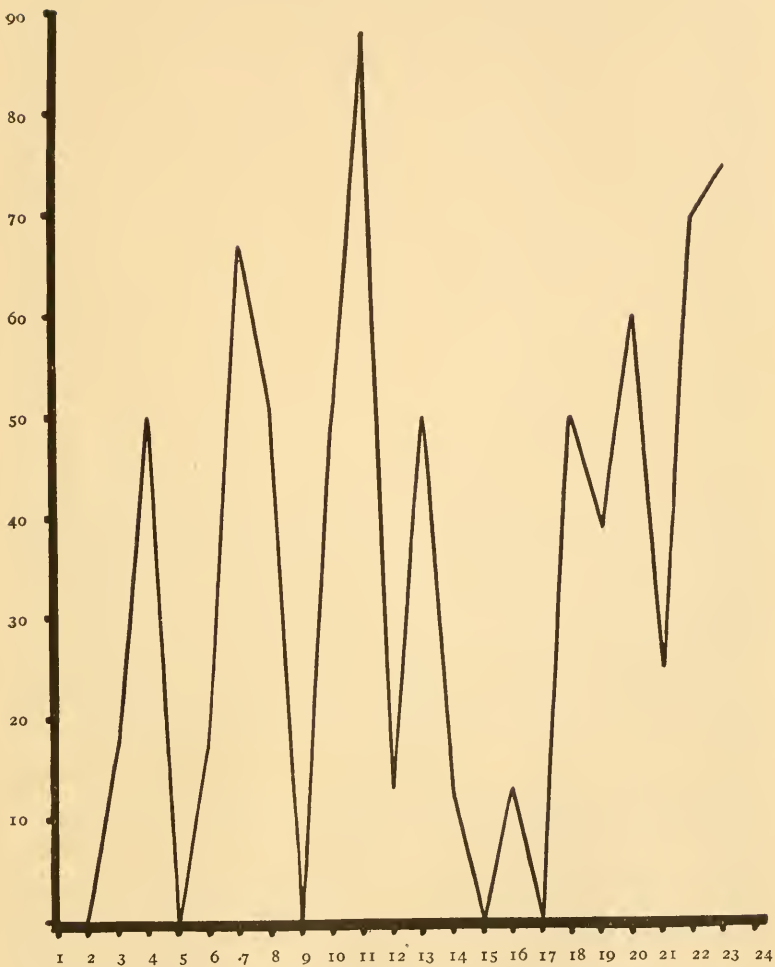


Fig. 6—Curve representing comprehension in the case of the same children as in Fig. 5. Compare Fig. 6 with Fig. 2. Note the extreme variation in ability in the case of these children.

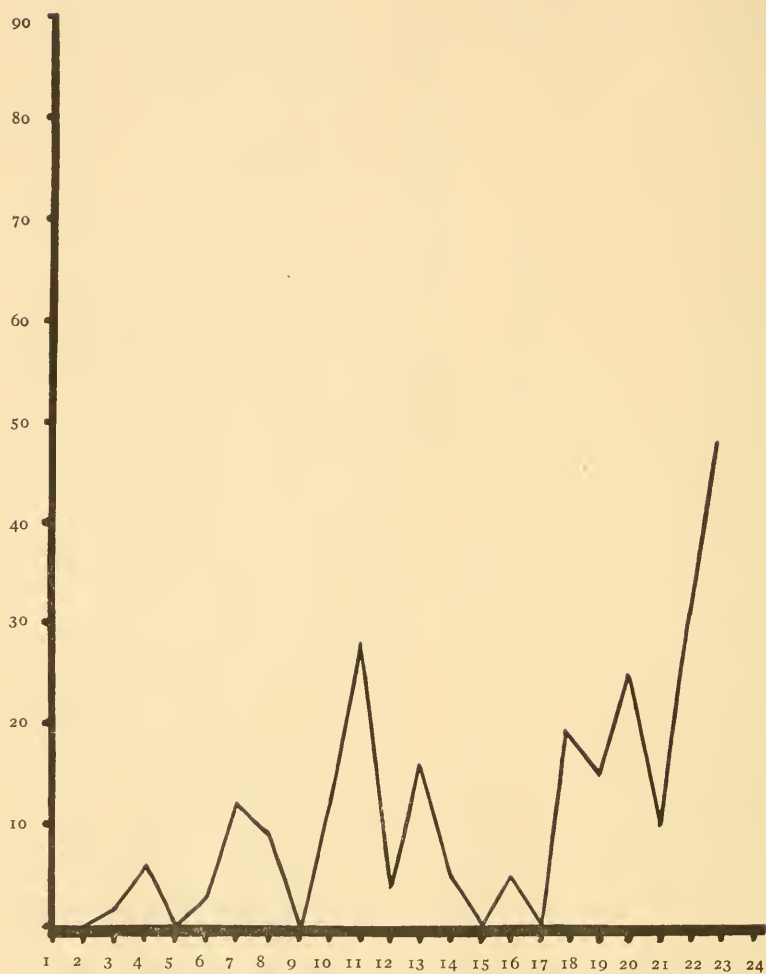


Fig. 7—Curve representing the reading efficiency of the same children as in Figs. 5 and 6. Compare Fig. 7 with Fig. 3. Note the low reading efficiency of these children.

shown in Tables 5 and 10 and in Figs. 4 and 8. The former represents a much more satisfactory distribution than the latter. In Fig. 8 it will be noted that the mode falls in the

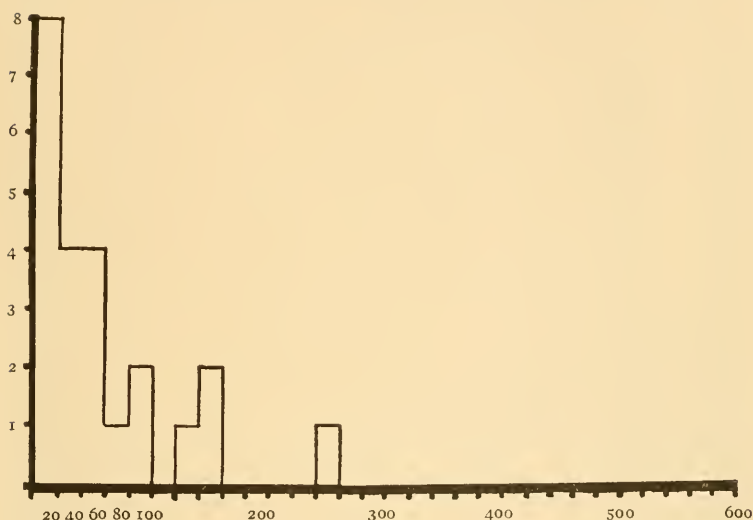


Fig. 8—Surface of frequency showing the distribution of reading efficiency of the same children as in Figs. 5, 6 and 7. Compare this surface of frequency with that in Fig. 4. Note that in Fig. 8 the mode falls in the lowest group. Fig. 8 shows a very unsatisfactory distribution as compared with Fig. 4.

lowest group—between 0 and 19.99—while in School A, Fig. 4, it falls at a much higher point on the scale—between 120 and 139.9.

In Figs. 9, 10 and 11 the facts in connection with a fourth grade of fifty-four pupils are represented. The object here is to show a condition which is about as unsatisfactory as we should expect to find, and is a good illustration of a state of affairs which is often found in many schools but which never ought to be permitted anywhere and for which there is no excuse. There are too many pupils in the class and the differences in ability are such that it is impossible to adapt instruction and material to the class as a whole. In

Fig. 10 is given a surface of frequency representing the distribution of comprehension in this grade, and in Fig. 11 the distribution of reading efficiency is shown. Both of these are highly unsatisfactory. In Fig. 10 there are five

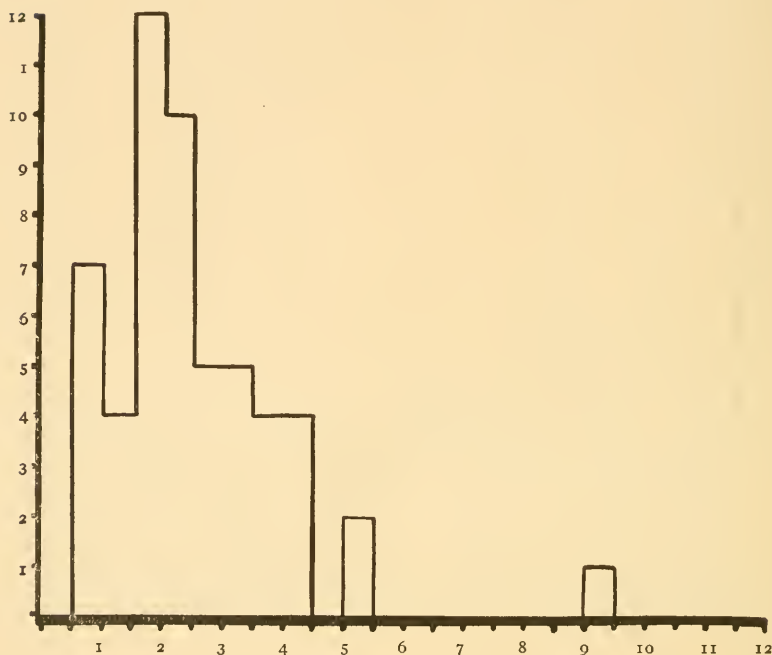


Fig. 9—Surface of frequency showing the distribution in the case of rate of reading in a fourth grade of 54 pupils. This is an example of a fairly satisfactory distribution.

distinct groups of pupils as regards comprehension. It is entirely impossible to adapt reading material and instruction to the widely divergent abilities of all of these pupils. In Fig. 11 three distinct modes are seen to exist. Reading material which would be of a suitable grade of difficulty for the lowest group, in which there are twelve pupils, would be entirely too easy for the pupils in the group represented by the third mode, which represents twenty-three pupils.

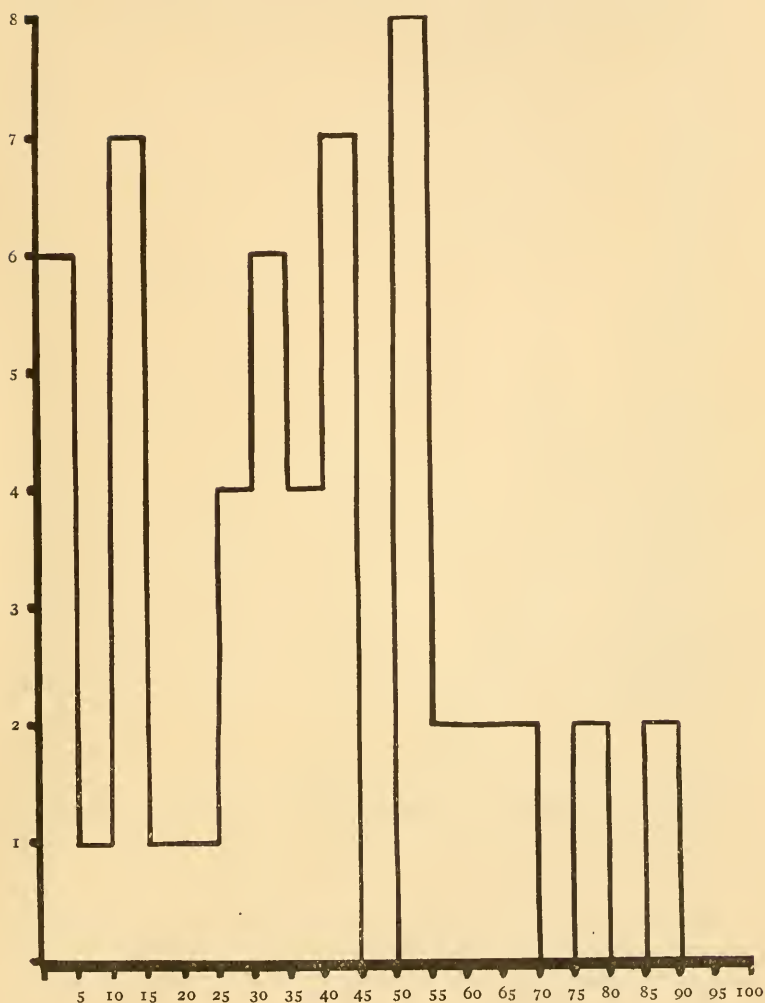


Fig. 10—Surface of frequency representing the distribution of comprehension of the same pupils as in Fig. 9. This is an example of a very unsatisfactory condition. There are 5 modes. The group is not a compact one as regards comprehension.

The extreme variations in ability in the different elements of reading efficiency in this grade are summarized in the statements which follow.

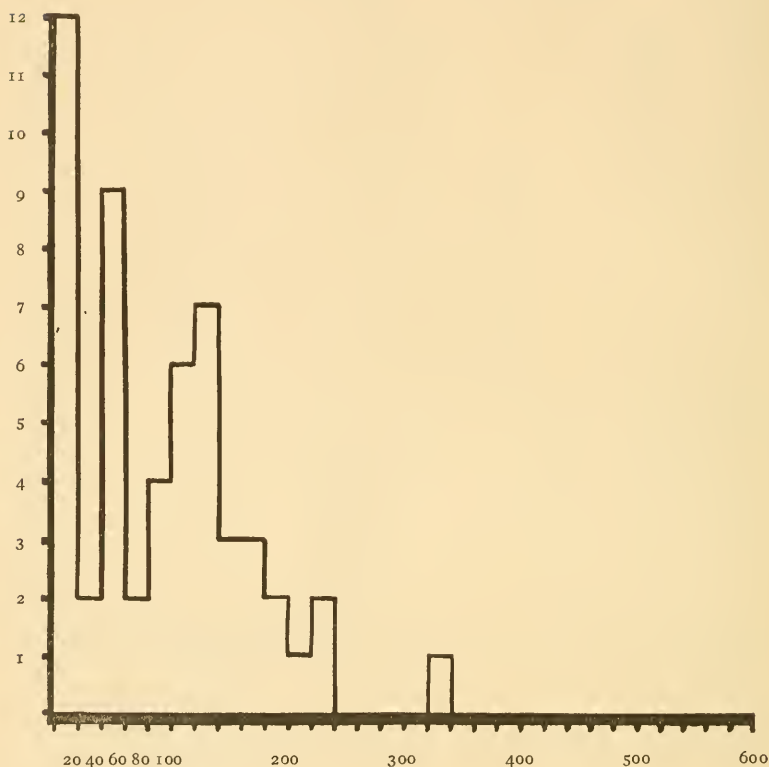


Fig. 11—Surface of frequency representing the distribution of reading efficiency of the same pupils as in Figs. 9 and 10. This represents an extremely bad condition. Note the 3 modes and the large number of pupils in the lowest group.

There are six pupils in the class who are totally unable to read. The best reader in the grade is nearly thirty-eight times as efficient as the poorest. The five best readers are about sixteen times as competent as the five poorest. The twenty best readers have about nine and one half times as

great reading ability as the twenty who have the least reading power. The fastest reader reads about sixteen times as rapidly as the slowest. The ten fastest readers read over five and one half times as rapidly as the ten slowest. There are six pupils in the class who failed entirely in comprehension. The best pupil in the grade in comprehension is nearly ten times as competent as the poorest. The ten pupils who are best in comprehension have over four and one half times as much ability in this direction as the ten who have the least ability.

COMPARISONS OF IMPROVEMENT.

Comparisons of the growths in reading rate, comprehension and reading efficiency from grade to grade may be made in the case of different schools in the same system. In Figs. 12 and 13 are two growth curves for reading efficiency. The difference in the ability of the pupils in the two schools is apparent at once. The situation in the school represented in Fig. 12 is very much less satisfactory than that in Fig. 13. In the former the improvement is steady from grade to grade but the efficiency is low and the highest reading ability is not reached until the seventh grade and a high reading capacity is not attained even then. In the latter school the improvement is steady and much more rapid from the third to the fifth grade at which nearly maximum efficiency is reached. With these facts in mind the superiority of the school in Fig. 13 is evident. At the fifth grade nearly double the reading efficiency of the other school has been attained. The pupils are equipped with a tool for thought-getting of correspondingly greater efficiency than that of those in the other school who are struggling along under a handicap which is as unnecessary in this particular case as it is serious as an encumbrance. Their capacity to study is reduced by their lack of ability to get the maximum content from what they read in a minimum of time. The marked difference in these two schools is due to the fact that



Fig. 12—Curve representing the growth in efficiency from third to eighth grade inclusive in one school system. The scale at the left shows the reading efficiency. The improvement from grade to grade is steady up to the seventh grade, but the efficiency is low throughout.

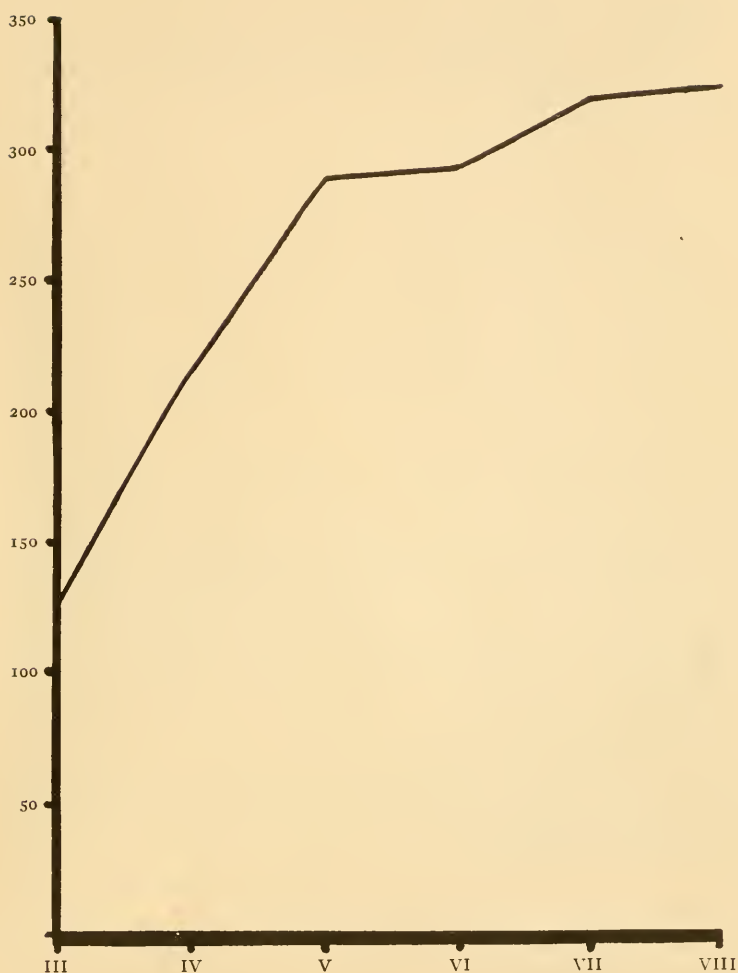


Fig. 13—Curve representing the growth in efficiency from third to eighth grade inclusive in one school system. Note the difference between this school and that represented in Fig. 12. The improvement is steady and rapid up to the fifth grade, at which a high efficiency is reached. After this, little improvement is made.

a better method is used in the school which shows the higher efficiency.

These two schools offer an excellent illustration of the way in which the effects of different methods of teaching reading may be studied.

STANDARD TESTS.

It is desirable that several reading tests be given to each class each year. After one test has been given near the beginning of the year, certain pupils, as previously indicated, will be found to be deficient in one or more aspects of reading ability. The proper procedure after each case has been properly diagnosed and the defect found is to apply the kind of instruction needed by the individual pupils. It will be desirable after a time to know what effect this remedial instruction is having, and so a second test should be applied. The experience of the writer indicates that to get the best results the reading ability of the class should be tested three times each year in the manner indicated in this bulletin. The first test should be given soon after the beginning of the school year, ordinarily about September 15, the second about the middle of the year, and the last one just before the close of school. These may be called standard tests.

For this purpose alternative selections for tests are necessary. Several of these have been prepared by the Bureau and keys have been made to accompany them. Others will be provided as needed.

PRELIMINARY TESTS.

In addition to the standard tests each teacher should give silent reading tests once a month to determine roughly the progress and comparative standing of the pupils in her grade. These may be called preliminary tests. For these, regular reading books of the grade may be used. If there is a sufficient supply of reading books on hand, one book which is representative of the grade of material which the class is reading, may be set aside for test purposes and used throughout the year. A book should be selected which has

reading matter of about the same grade of difficulty throughout in order that some idea of the progress of the pupils from month to month may be secured.

The preliminary silent reading tests should be conducted in the same general manner as the regular standard tests. The pupils may be asked to open their books and turn them face down upon their desks. The teacher may then read enough of what precedes to enable them to get the connection. At a signal they may turn their books and continue the reading silently. After the reading they may reproduce in writing what they have read. This reproduction should be carefully examined and graded with sufficient care to get a good estimate of each pupil's ability to reproduce accurately what he has read. This testing should be a part of the regular reading and composition work of the school.

A test of this kind ought to give each teacher a very good idea of the abilities of her pupils and it ought to tell her with a reasonable degree of correctness what the particular needs of individual pupils are as regards future instruction and also the needs of the class as a whole. Tests of this kind have been given monthly in School A to which reference has been made previously. It is evident that the results fully warrant the time expended. In this school each grade forms a much more compact group than was the case in any other school system tested. *This was due to the fact that instruction was adapted to scientifically determined needs of individual pupils.* As might be expected under such conditions, the average efficiency of this school as a whole was the highest of any tested.

PROPOSED TENTATIVE STANDARDS.

At the present time there are no standards for the different aspects of reading ability as measured in the manner advocated in this bulletin. The question has been raised as to what principle shall be followed in establishing such standards. Shall the standard for rate of reading for a given grade be the average—or the median—score for a very large number of similar grades involving many thousand children? It seems to the writer that the highest attain-

ment found in any grade of normal pupils under normal conditions, provided the grade includes a reasonably large number of pupils, is a more satisfactory standard for present use for that grade than the average or median of a large number of similar grades. The proposed standards given in Table II were made in this way and represent a considerable number of school systems. The facts of Table II are also shown in Figs. 14, 15 and 16. The object of these

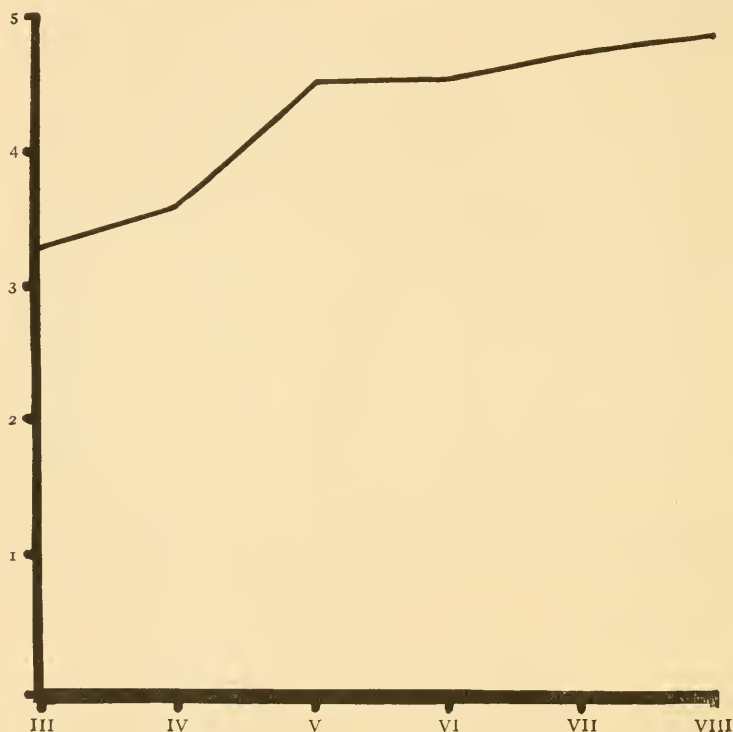


Fig. 14—Curve representing the growth in rate of reading from third to eighth grade inclusive. This curve was drawn by taking the highest third grade found thus far, the highest fourth, and so on. The object of this curve is for purposes of comparison. When a superintendent has measured his reading he may compare his school with this curve, and know in what respects it exceeds or fails to reach the highest average scores thus far found with this test. This curve may be taken as a tentative standard in connection with this particular reading test.



Fig. 15—Curve representing the growth in comprehension from third to eighth grade inclusive. This curve was drawn in the same manner as that in Fig. 14. It may be taken as a tentative standard for this particular reading test.

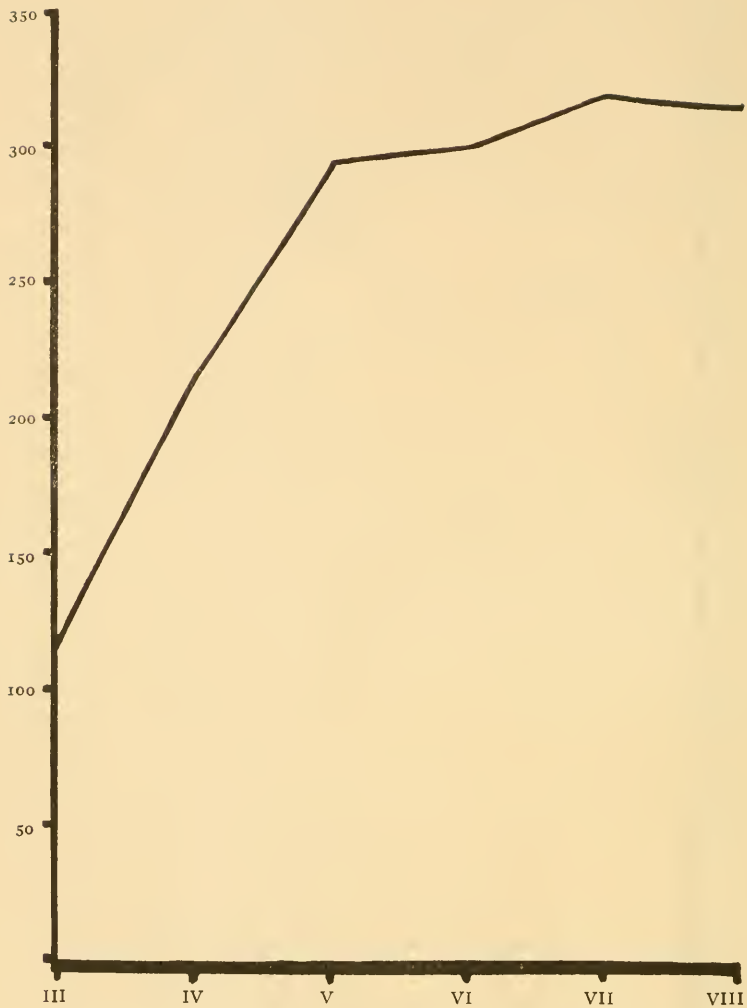


Fig. 16—Curve representing the growth in reading efficiency from the third to eighth grade inclusive. This curve was drawn in the same manner as those in Figs. 14 and 15. It may be taken, also, as a tentative standard.

TABLE II
PROPOSED TENTATIVE STANDARDS IN READING

Grade	Highest Grade Average for Rate of Reading	Highest Grade Average for Comprehension	Highest Grade Average for Reading Efficiency
III	3.32	46	127.82
IV	3.55	65	217.13
V	4.49	61	290.96
VI	4.54	68	294.95
VII	4.65	87	322.33
VIII	4.84	79	323.57

standards at the present time is for purposes of comparison. A superintendent or principal, after testing his school system with the reading test in connection with which these standards were derived, may compare the results with them. He may then know that his grades exceed, reach or fall below the highest grade averages thus far found with this particular test. The value of being able to make such a comparison is obvious.

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